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(71) Applicant(s)
Valeo Climate Control Limited

(Incorporated in the United Kingdom)

Heol-Y-Mynydd, Gorseinon, SWANSEA, SA4 4NY,
United Kingdom

(72) Inventor(s)
Paul Whittington Morris

(74) Agent and/or Address for Service
Page White & Farrer
54 Doughty Street, LONDON, WC1N 2LS,
United Kingdom

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(54) Vehicle ventilation system

(57) In a ventilation system for a vehicle in which an air filter or evaporator element (12) can be inserted via a closable opening laterally into an installed position extending transversely across the internal passageway of an air duct (10), a restrictor plate (17) is hingedly mounted in the duct (10) in such a manner that, when the element (12) is installed, it holds the restrictor plate (17) in an inoperative raised position but, in the absence of the element (12), the restrictor plate (17) swings down to an operative position extending part way across the internal passageway to provide a restriction of the air flow compensating for the absence of the restriction which would be caused by the element (12) if present.

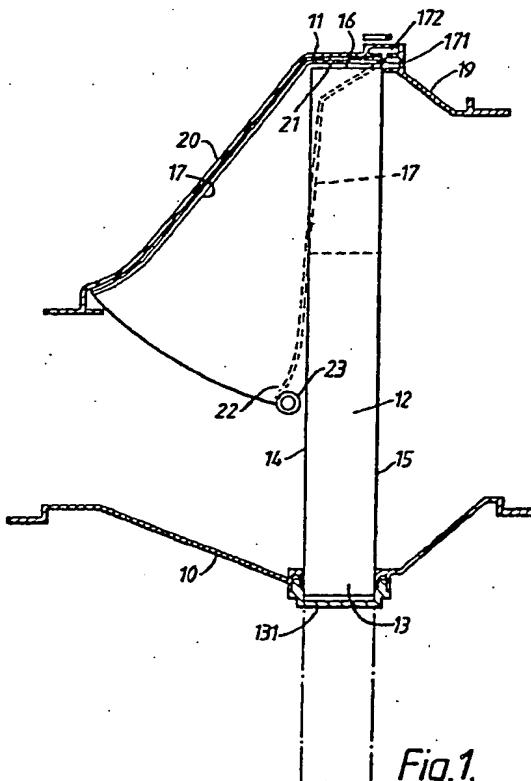


Fig.1.

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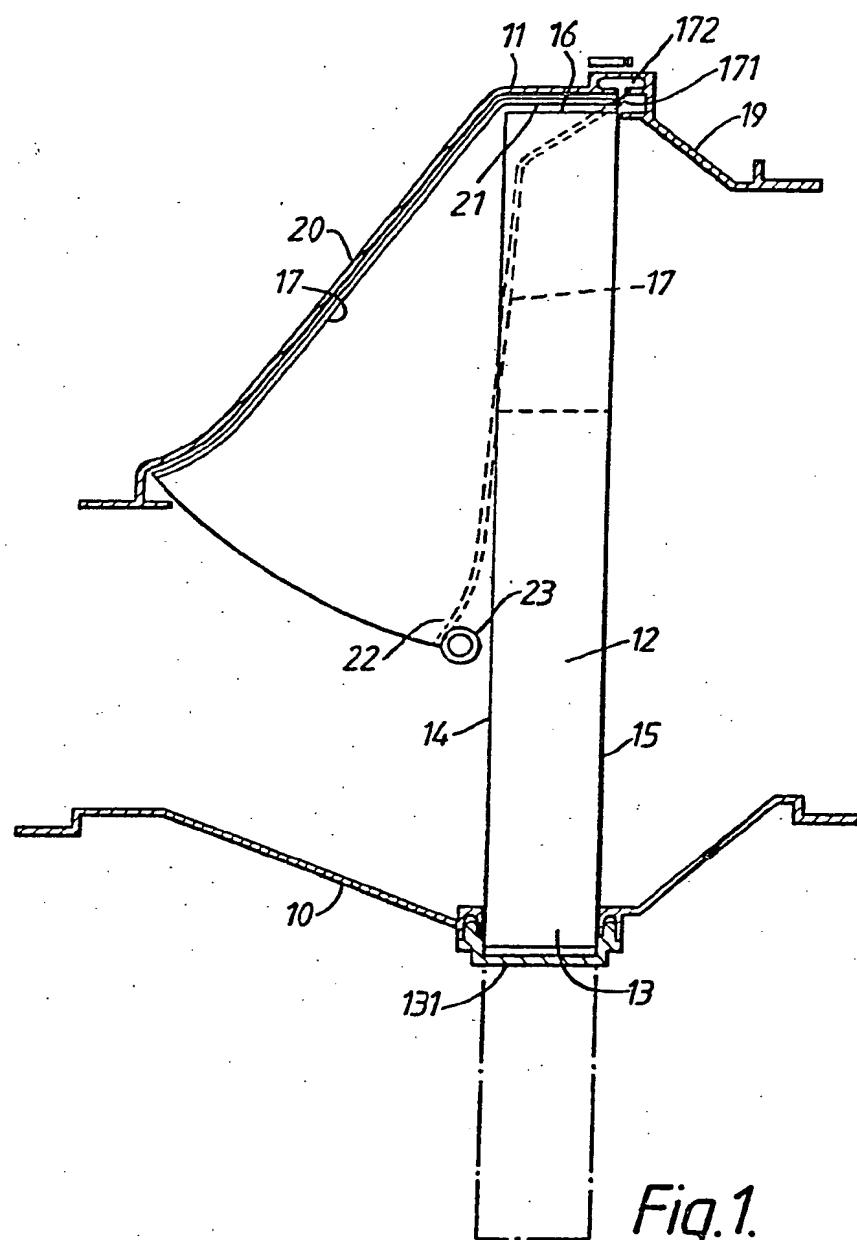


Fig. 1.

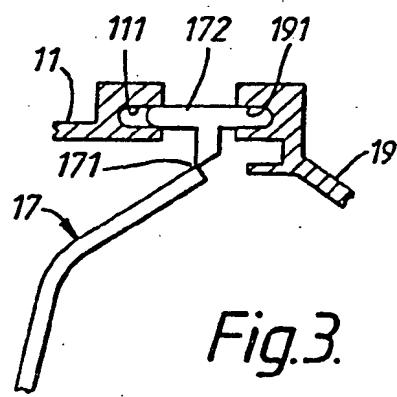


Fig. 3.

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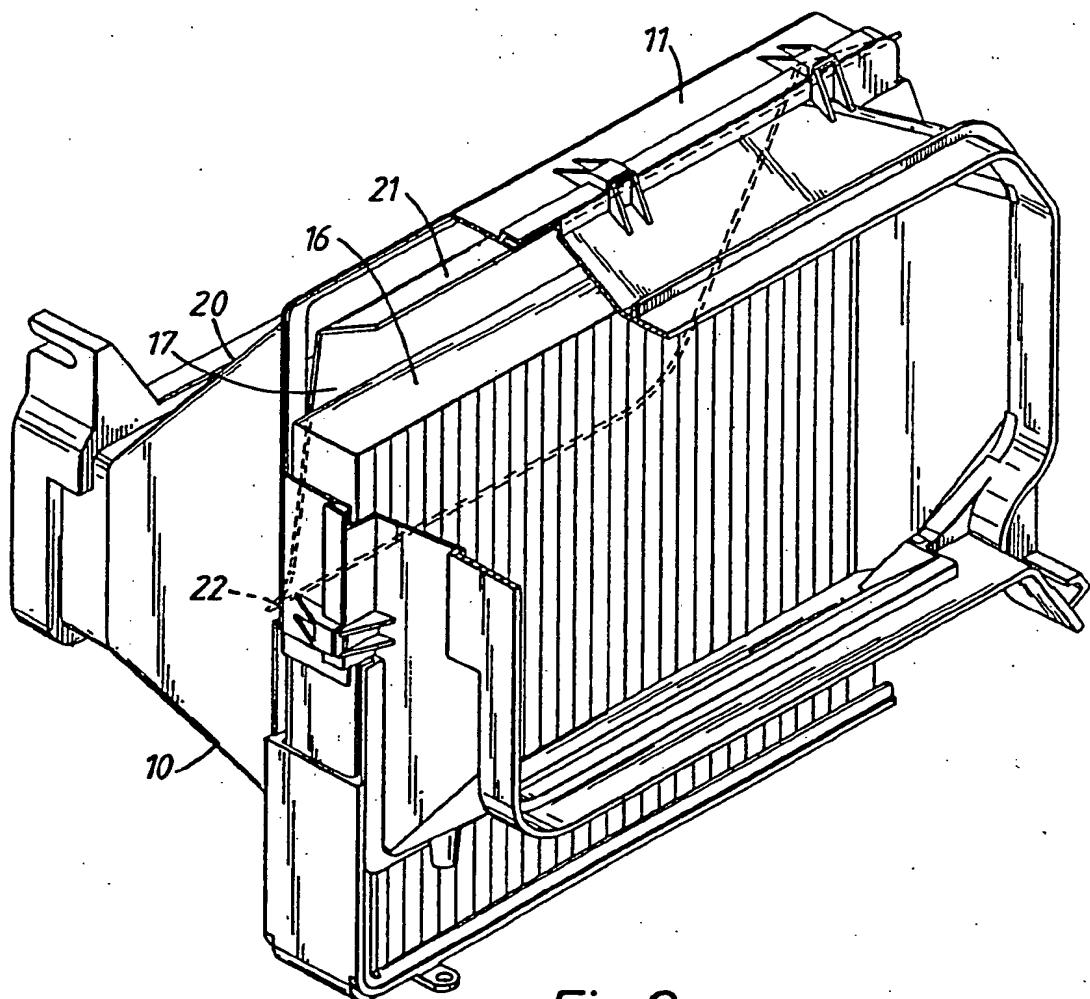


Fig.2.

VENTILATION SYSTEM FOR A VEHICLE

This invention relates to ventilation systems for vehicles, of the kind comprising an air duct leading from an air inlet to the interior of the vehicle and provided with a closable lateral opening permitting an air filter element to be inserted into an installed position extending transversely across the internal passageway of the duct. The duct may also contain an electrically driven fan and an air heater and/or cooler.

In practice it is found that air filters are required in vehicles to be sold in some markets but not in others, but it is desirable for reasons of cost to fit the same ventilation system in all vehicles of a given model. The presence of an air filter element in the air duct produces a restriction in the air flow, so that mere omission of the filter element would result in increased airflow through the system and greater power consumption (e.g. by an electric fan motor) for a given setting of the ventilation system controls.

It is an object of the present invention to provide a simple arrangement by which the same ventilation system may be used with or without a filter element, without requiring alteration of the ventilation system controls.

According to the present invention there is provided a ventilation system for a vehicle, comprising an air duct leading from an air inlet to the interior of the vehicle and provided with a closable lateral opening permitting an air filter element to be inserted into an installed position extending transversely across the internal passageway of the duct, wherein a restrictor plate is located in the duct in such a manner that, when a filter element is present in the installed position, the restrictor plate is held by the filter element in an inoperative position against a wall of the duct but, in the absence of a filter element, the restrictor plate assumes an operative position in which it extends part way across the internal passageway of the duct so as to restrict air flow therethrough.

With this arrangement, the restrictor plate can readily be dimensioned so as to produce, in the absence of a filter element, a similar restriction of the air flow to that produced by a filter element when present. The ventilation system controls accordingly require no alteration to allow for the absence of a filter element.

Preferably the restrictor plate is hinged along the side of the air duct opposite to the opening through which the filter element can be inserted.

A fixed abutment may be provided, extending at least part way across the air duct, to support the restrictor plate in its operative position in the absence of a filter element.

In the preferred embodiments of the invention, the filter element has two substantially parallel faces which in the installed position extend transversely across the air duct and a side face which engages a complementary surface on the restrictor plate to hold the latter in its inoperative position. Preferably the said side face of the filter element is flat and the complementary surface on the restrictor plate is also flat and is disposed adjacent to the hinge of the restrictor plate.

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

Fig. 1 is a diagrammatic longitudinal section through part of an air duct of a vehicle ventilation system, showing an air filter element and restrictor plate in full lines, in the installed position of the filter and the inoperative position of the restrictor plate, and in broken lines, in a partly withdrawn position of the filter element and the operative position of the restrictor plate.

Fig. 2 is a perspective view, with parts broken away, of the same part of the air duct, showing the filter element in the partly withdrawn position and the restrictor plate in its operative position, and

Fig. 3 is a sectional view, to a larger scale, of the mounting of the restrictor plate and its hinge.

As shown in Figs. 1 and 2, the air duct 10 (which may be of plastics material) is of rectangular cross-section and has an enlarged portion 11 to receive a rectangular air filter element 12. The enlarged portion 11 has a lateral aperture 13 along its lowermost side to permit insertion and withdrawal of air filter element 12. The aperture 13 can be closed by a plate or door 131. The enlarged portion 11 is secured around its circumference to a convergent downstream portion 19 of the air duct 10. The air filter element 12 has two substantially parallel faces 14, 15 which in the installed position, shown in full lines in Fig. 1, extend transversely across the internal passageway of the air duct 10, and a flat upper side face 16.

A restrictor plate 17 (which may also be of plastics) is secured to the upper side of the enlarged portion 11 of the duct 10 at 18, and provided with a horizontal hinge 171 so as to be moveable between an inoperative raised position, shown in full lines in Fig. 1, and an operative position shown in broken lines in Fig. 1. As shown in Fig. 3, the upper horizontal edge 172 of the restrictor plate 17 is moulded with a T-section, the horizontal limbs of which are located in corresponding grooves 111, 191 in the duct portions 11, 19, so that the plate 17 is clamped in position on assembly of the air duct 10. Immediately below its upper edge 172, the restrictor plate 17 is moulded with a thinned-down portion forming the horizontal hinge 171. In the relaxed position, the portion of the restrictor plate 17 below the hinge 171 assumes the operative position shown in broken lines in Figs. 1 and 2 and in full lines in Fig. 3. The restrictor plate 17 is of similar form to the adjacent upper wall 20 of the duct 10, so that when in the inoperative raised position, the restrictor plate lies in contact with the inner surface of the wall 20 and is inoperative to restrict the air flow, which passes from left to right in the Figures. When the air filter element 12 is in its installed position, its flat upper side

face 16 contacts the underside of a complementary flat surface 21 on the restrictor plate 17 and holds it in the raised inoperative position.

On withdrawal of the filter element 12, as shown in broken lines in Fig. 1, and in Fig. 2, the restrictor plate 17 pivots downwards about the hinge 18 to the operative position shown in broken lines in Fig. 1 and in Fig. 2. In this position, a lower edge part 22 of the restrictor plate 17 contacts an abutment or abutments 23 extending at least part way across the air duct 10, so as to support the restrictor plate in its operative position. The air flow travelling from left to right in the drawings holds the plate 17 against the abutment 23.

The restrictor plate 17 is so dimensioned that, in this operative position, it closes off enough of the cross-section of the internal passageway of the air duct 10 to restrict the air flow therethrough so as to compensate for the removal of the restriction caused by the air filter element 12.

The air filter element 12 may, in the case of an air conditioning installation, take the form of an evaporator unit for cooling the air.

CLAIMS

1. A ventilation system for a vehicle, comprising an air duct leading from an air inlet to the interior of the vehicle and provided with a closable lateral opening permitting an air filter element to be inserted into an installed position extending transversely across the internal passageway of the duct, wherein a restrictor plate is located in the duct in such a manner that, when a filter element is present in the installed position, the restrictor plate is held by the filter element in an inoperative position against a wall of the duct but, in the absence of a filter element, the restrictor plate assumes an operative position in which it extends part way across the internal passageway of the duct so as to restrict air flow therethrough.
2. A ventilation system according to Claim 1, wherein the restrictor plate is hinged along the side of the air duct opposite to the opening through which the filter element can be inserted.
3. A ventilation system according to Claim 1 or 2, wherein a fixed abutment is provided, extending at least part way across the air duct, to support the restrictor plate in its operative position in the absence of a filter element.
4. A ventilation system according to any one of the preceding claims, wherein the filter element has two substantially parallel faces which in the installed position extend transversely across the air duct and a side face which engages a complementary surface on the restrictor plate to hold the latter in its inoperative position.

5. A ventilation system according to Claim 4, as appendant to Claim 2, wherein the said side face of the filter element is flat and the complementary surface on the restrictor plate is also flat and is disposed adjacent to the hinge of the restrictor plate.

6. A ventilation system for a vehicle, substantially as hereinbefore described with reference to the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

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Relevant Technical fields	Search Examiner
(i) UK CI (Edition 1)	F4V (VFC, VFX, VFYA, VFYD, VFYM, VFYN, VFYX, VGAA, VGAB, VGAC, VGAX, VGBP, VGBR, VGBV, VGBW, VGBX) B60H
(ii) Int CI (Edition 5)	A N BENNETT
Databases (see over)	Date of Search
(i) UK Patent Office	13 MAY 1993
(ii)	

Documents considered relevant following a search in respect of claims

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Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

Category	Identity of document and relevant passages g.	Relevant to claim

Categories of documents

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